

Patent claims

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1. A process for the oxidation of organic substrates by means of  $^1\text{O}_2$ , which comprises adding 30-70% strength  $\text{H}_2\text{O}_2$  to hydrophobic organic substrates which react with  $^1\text{O}_2$  in an organic solvent in the presence of a heterogeneous or homogeneous catalyst, whereupon, following the catalytic decomposition of  $\text{H}_2\text{O}_2$  to give water and  $^1\text{O}_2$ , oxidation to give the corresponding oxidation products takes place.
2. The process as claimed in claim 1, wherein the substrates which react with  $^1\text{O}_2$  used are olefins which contain 1 to 10  $\text{C}=\text{C}$  double bonds;  $\text{C}_6$ - $\text{C}_{50}$  phenols, polyalkylbenzenes, polyalkoxybenzenes; polycyclic aromatics having 2 to 10 aromatic rings; alkyl sulfides, alkenyl sulfides, aryl sulfides which are either mono- or disubstituted on the sulfur atom, and  $\text{C}_4$ - $\text{C}_{60}$  heterocycles having an O, N or S atom in the ring, which may be unsubstituted or may be mono- or polysubstituted by halogens, cyanide, carbonyl groups, hydroxyl groups,  $\text{C}_1$ - $\text{C}_{50}$  alkoxy groups,  $\text{C}_1$ - $\text{C}_{50}$  alkyl groups,  $\text{C}_6$ - $\text{C}_{50}$  aryl groups,  $\text{C}_2$ - $\text{C}_{50}$  alkenyl groups,  $\text{C}_2$ - $\text{C}_{50}$  alkynyl groups, carboxylic acid groups, ester groups, amide groups, amino groups, nitro groups, silyl groups, silyloxy groups, sulfone groups, sulfoxide groups or by one or more  $\text{NR}^1\text{R}^2$  radicals in which  $\text{R}_1$  [sic] or  $\text{R}_2$  [sic] may be identical or different and are H;  $\text{C}_1$ - $\text{C}_{50}$  alkyl; formyl;  $\text{C}_2$ - $\text{C}_{50}$  acyl;  $\text{C}_7$ - $\text{C}_{50}$  benzoyl, where  $\text{R}^1$  and  $\text{R}^2$  may also together form a ring.
3. The process as claimed in claim 1, wherein the solvent used is  $\text{C}_1$ - $\text{C}_8$ -alcohols, formamide, N-methylformamide, dimethylformamide, sulfolane, propylene carbonate.

4. The process as claimed in claim 4, wherein the solvent used is methanol, ethanol, propanol, isopropanol, ethylene glycol, propylene glycol, formamide, N-methylformamide or dimethylformamide.

5. The process as claimed in claim 1, wherein catalysts based on molybdenum, tungsten, scandium, vanadium, titanium, zirconium, praseodymium, neodymium, samarium, europium, terbium, dysprosium, holmium, erbium, ytterbium or lutetium in the form of oxides, oxo complexes, nitrates, carboxylates, hydroxides, carbonates, chlorides, fluorides, sulfates or tetrafluoroborates are used.

6. The process as claimed in claim 1, wherein 2 to 10 equivalents of  $H_2O_2$  are used depending on the substrate used.

7. The process as claimed in claim 1, wherein the reaction temperature is between 0 and 50°C.

8. The process as claimed in claim 1, wherein, following the reaction of the hydrophobic organic substrates which react with  $^1O_2$  in a monohydric  $C_1$ - $C_8$  alcohol as solvent in the presence of a molybdate catalyst with 30-70% strength  $H_2O_2$  to give the corresponding oxidation products, the removal and recycling of the precipitated-out catalyst when the reaction is complete is carried out by simple centrifugation or filtration.

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